Title: A quantitative study into perceptions and attitudes of corporate social responsibility and sustainability developments in international shipping.

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ABSTRACT - In recent decades the international community has demonstrated a growing concern and tendency to halt adverse environmental impacts generated by business activities. Among a plethora of regulatory initiatives and collaborations, the 2030 Agenda, and incorporated 17 Sustainable Development Goals (SDGs), represent United Nations recent remarkable development toward this direction. The International Maritime Organization (IMO), as the United Nations (UNs) specialized Agency to deal with safety at sea and protection of the marine environment has been, actively, engaged and harmonized its strategy with global sustainability mandates. Similarly, a great deal of research and motivation has been placed on corporate social responsibility (CSR), as a business operating model that goes beyond regulatory compliance and integrates sustainability challenges. In view of the limited amount of related research in the tanker and dry bulk sector, the purpose of this paper is to investigate and provide a better understanding against perceptions and attitudes of CSR and sustainability in shipping. Research data collected via a questionnaire survey conducted in 50 shipping companies, based on 14 countries worldwide and managing tankers and/or dry bulk carrier ships. Hence, C*hi-square test of independence* and *Spearman's correlation coefficient* measures are employed to test the statistical significance and strength of association between selected variables, verifying, thus, our formulated hypotheses. Findings show that shipping companies perceive CSR as a voluntary and beyond regulatory compliance businesses approach that, furthermore, shares current sustainability aspects. Moreover, shipping companies have been, increasingly, integrating into their safety management system (SMS) provisions of CSR and sustainability principles, while, at the same time, seek to remain compliant with statutory maritime legislation. However, certification against an official CSR Standard and, subsequent, adoption of standardized CSR measurement and reporting methods, has not yet been the case in shipping.

***Keywords*;** Corporate social responsibility; sustainable shipping; safety management systems; tanker/dry bulk maritime sector

1. Introduction

Corporate Social Responsibility refers to a concept that has been, gradually, extended and applied to a wide spectrum of business activities. Although difficult to be precisely defined, however, it can be assumed that CSR concept derives from the expectations a society has from enterprises. And such expectations go beyond the mere fulfillment of company's financial obligations towards employees [36]. An underlying idea here is that, either intentionally or unintentionally, business operations generate impacts that affect the economic, social and environmental system in which they function. In the era of climate change and environmental challenges, companies are closely scrutinized for their business decisions and the impact they bring to society. Therefore, stakeholders, namely, those who, directly or indirectly, are affected by organizations' activities, foresee firms as entities that have a societal role to fulfill, along with their profit making pursuit [4]. With regards to sustainable development, the term was first introduced by *'Our Common Future'* report, published by the United Nations World Commission on Environment and Development (WCED), in 1987. Such report, along with a complete diagnosis of the environmental situation and imminent climate change challenges, introduced one of the most, commonly, used definition of sustainable development, which is: "*the* d*evelopment that meets the needs of current generations without compromising the ability of future generations to meet their own needs*" [40].

The shipping industry has been significantly impacted from worldwide CSR and sustainability developments. Presently, the International Maritime Organization has welcomed latest United Nations 2030 Agenda on Sustainable Development and associated Sustainable Development Goals. As a result, in an attempt to cope with current United Nations sustainability mandates, the International Maritime Organization has already published its Strategic Directions (SD) and High level Action Plan (HLAP), for the 2016-2017 period [19]. Such initiative refers to a remarkable sustainability undertaking throughout IMO's long history, which, furthermore, has explicitly recognized corporate social responsibility as a mean to achieve sustainable development. In that respect, it is of great significance the Organization's statement, made during World Maritime Day symposium, on 26 September 2013, that a sustainable maritime transportation System "*should be achieved, inter alia, by anchoring the vision of sustainable development into "Corporate Social Responsibility" (CSR) related activities"* [18]. However, under the light of 2030 Agenda on Sustainable Development, and with the exception of a few shipping segments (i.e. container, cruise/passenger maritime sector), there is not much available research to light CSR and sustainability understanding and practices in the remaining maritime segments (i.e. dry and tanker) [23].

In that sense, through an empirical investigation conducted in dry bulk and tanker shipping sector, this study investigates contemporary perceptions and attitudes borne by latest CSR and sustainability regulatory developments.

2. Background

The adequacy of natural resources to meet society's standing needs refers a deeply intellectual and practical issue that has, regularly, been the subject of analysis and research of several sciences and disciplines (i.e. economics, environmental, physics, engineering etc.) [9]. Scarcity of world's natural resources and undesirable environmental impacts, generated by the increasing use of land, air and sea, threaten society's prosperity and have been quite frequently recognized as causing factors of conflicts around the globe [13]. The predominant role of the oceans, as a vital source of life and economic development, has given rise to establishment of an institutional and legal framework, founded and exercised at international, regional, national and local level. The United Nations Convention on the Law of the Sea (UNCLOS) and the establishment of the International maritime Organization are some of the most vigorous ventures and sources of ocean governance in an attempt to oversee and ensure the sustainable use of the sea [32].

The theoretical framework for sustainable development initially came up, as a notion, between 1972 and 1992. The United Nations Conference on the Human Environment, at Stockholm, in 1972, was the first dedicated international meeting with a focus on worldwide sustainability challenges [40]. Since then, increasing environmental concerns and the necessity to balance environmental and social implications with economic pursuits have triggered a series of international conferences and global sustainability initiatives [38]. However, the 2030 Agenda for Sustainable Development, incorporated 17 Goals and 169 associated targets, adopted on September 2015, at United Nations Headquarters, represents UN's latest distinguished resolution. With that movement, United Nations entered a new era and shared a new vision for sustainable development that will lead the world for the next 15 years [35]. It is worth commenting at this point that a notable feature of the 2030 Agenda was the identification and disclosure of sustainable development under its three dimensions: *economic, social and environmental* (known also as the triple bottom line approach) [41].

Likewise sustainability trends, the concept of corporate social responsibility has become increasingly important in the business arena. Although there is not an agreed definition, however, CSR is mostly defined as *"a concept whereby companies integrate social and environmental concerns in their*

business operations and in their interaction with their stakeholders on a voluntary basis" [4]. However, CSR does not refer to a newly born idea and its origins are traced back in the '*social contract theory'*. The concept of 'social contract' was born centuries ago and, in its earliest version, had stressed the rights and responsibilities of the state to its citizens and vice versa. In line with social contract theory, the '*Iron law of Responsibility*' assumes that the power gained by private enterprises bears moral obligations to society [10]. In another perspective, it has been argued that CSR has its roots to stakeholder theory and, as such, encompasses business pursuits to manage relationships and risks generated by their interaction with stakeholders [1]. In our era, growing environmental concerns and the need to consider business impacts in an integrated manner (namely, from a social, economic and environmental angle) have transformed CSR thinking to a more managerial tool that embraces sustainability challenges [5].

The internationality and efficiency of shipping, as a mean of carrying 90% of internationally traded throughput, has been well recognized [16]. However, shipping has, at all times, been considered a risky business with a lot of perils to be originated by seaborne transport of goods. Dealing with risks has always been a routine for maritime professionals and, as a matter of fact, either directly or indirectly, maritime personnel has continuously been conversed with themes such as, health, safety and environmental protection, stakeholder management, seamen labor rights, energy efficiency and emissions reduction. Moreover, the management of ships requires several cross-border maritime activities and transactions to be taking place on a daily basis among multinational entities and stakeholders [8]. However, it is reasonable to assume that verifying ships' seaworthiness and preserving the marine environment is not a matter to be left to the discretion of a sole entity, namely the ship-owners. Certainly, those have been tasked with the technical management of ships have assumed the primal responsibility to ensure the seaworthiness of their vessels. Though, the complicated and multilateral nature of the shipping business generates difficulties and contrasting interests among entities, in their attempt to offset commercial pursuits with regulatory requirements [34].

Concerns and complexity of maritime business, as indicatively discussed above, have been framed and constitute part of the scope of the ocean governance system. Currently, perhaps more intensively than ever before, there is an obvious growing trend to establish a sustainable and socially responsible shipping industry. In the light of the United Nations 2030 Agenda, the maritime community has transformed its approach to sustainability, which, unambiguously, is now seen as an integrated notion (economic, social and environmental) that needs to be enclosed in a CSR framework [18]. In the light of such progresses, maritime companies have been renovating and adjusting their strategies focusing on major areas of risk such as: energy efficiency, emissions reduction, stakeholder engagement, positive impact in local

communities, navigational safety, labor and human rights, health and safety in their operations, technology upgrading and sustainability disclosures. An indicative example of that trend is the container and cruise shipping industry where it has been witnessed a profound motivation and adoption of sustainability and CSR initiatives [23]. However, despite the rising tendency to establish a standardized framework, there is not much available research to light CSR and sustainability perceptions and practices in international shipping, which are, mainly, seen as a voluntary undertaking, associated with maritime safety, environmental and quality management matters [20].

The aim of this paper is to investigate and portray perceptions and practices associated with CSR and sustainability encounters, as experienced by shipping companies operating in the dry and tanker shipping sector. Assessing theoretical and practical implementation matters will provide us with a better understanding of CSR and sustainability notions in shipping. Likewise, in an effort to comply with United Nations latest regulatory developments, study results and conclusions will facilitate the identification of shipping industry's awareness and practical approach to CSR and sustainability, allowing, thereby, achievement of a more sustainable maritime transportation system.

3.1 Awareness and attitude

Analysing further the concept of iron law of responsibility, it has been concluded that corporate social responsibility, although not easily approachable due to its several aspects, though, can be interpreted as the company's culture and willingness to consider and act beyond the narrow and established financial, technical and regulatory requirements [10]. According to Aras and Crowther (2008), CSR is perceived as a voluntary business tool that goes beyond mere compliance with mandatory regulations and integrates sustainability within organization. In that sense, CSR incorporates also an ethical dimension, which reflects social norms, cultural and society's expectations. Such area of concern lies beyond regulatory control and is a matter of every firm to operate responsibly and minimize risks to its stakeholders [25]. Equivalent to this stance has also been the declaration of European Commission (EC), which suggests that a socially responsible firm should go beyond mere compliance with applicable legislation and deal with social, environmental, ethical, human rights and stakeholder challenges, in an integrated manner and at strategic level [11]. In line with EC approach, Lombardo (2009) supports that a CSR initiative expands beyond firm's statutory obligation and relates to a voluntary action that, proactively, seeks to internalize negative impacts and, in the long-term, reduce business risks (i.e. environmental pollution, conflicts with stakeholders etc.). What can be inferred at this point is that sustainability elements (i.e. several social, environmental and economic aspects) are embedded and form part of CSR managerial approach [22].

Elkington (2013), in 1994, was the first who addressed the three elements of sustainability in one term, namely, the: '*triple bottom line'* [12]. Nowadays, such approach to sustainable development is more topical than ever, since it encompasses the expectations of modern era to cope with sustainability in an integrated manner [2]. Consistent with this approach to sustainability, United nations 2030 Agenda stressed the need to consider sustainable development as an integrated element (social, environmental and economic) and, furthermore, embrace such initiative under a CSR business framework [39]. According to a study on CSR implementation, carried out in the Baltic Sea maritime sector, CSR has not been merely recognized as a mean to deal with minimum maritime health, safety and environmental regulation. Contrary, CSR engagement was perceived as a mean to contribute to the overall company's social, environmental and economic performance, advance the quality of provided services, enhance company's reputation and offer, thus, a competitive advantage [20]. Correspondingly, the beyond compliance approach to sustainability has been also encompassed in another IMO's statement, made at World Maritime Day symposium, September 2013, that "*optimally, a safety culture should go beyond mere regulatory compliance and deliver added value for the System through the promotion of safety culture aims"* [18]. As it can be deduced so far, such readings have paved the way forward to a more integrated manipulation of CSR and sustainability in shipping. In such a new scheme, CSR has been recognized as a voluntary and beyond regulatory compliance concept which, furthermore, intersects and integrates current sustainable development mandates (as has been formulated under the triple bottom line approach) [39]. Under such analysis, we could assume that the concepts of CSR and sustainable development have plenty intersections. It is expected, thus, that perceiving sustainability under its three dimensions will influence and contribute to CSR understanding as an integrated and beyond regulatory compliance notion. It is, therefore, hypothesized that:

H_1: CSR understanding as an integrated and beyond regulatory compliance notion is significantly influenced by sustainability perception under its three dimensions.

3.2 Practices, Measurement and Disclosure

In broad terms, and depending on the industry's applicable local and/or international legislation, it is the duty of every employer to establish a safety management system and define all resources and organizational arrangements necessary for managing health, safety and environmental risks at the workplace [15]. There are various legal frameworks (at regional, national and international level) that dictate the establishment of a safety management system. For example, the Health & Safety at Work Act

1974 (HSWA), sets the basis for health and safety law and employers and employees duties in United Kingdom [17]. Likewise, in shipping, the introduction of the International Safety management (ISM) Code, by IMO, in 1998, aimed at setting the legal framework for the establishment of a safety management system that considers all applicable regulatory requirements and prescribes specific procedures to minimize risks [28]. Treating CSR as a business model, it arises that ensuring a risk free workplace constitutes an integral component of business CSR strategy [7]. Moreover, as previously discussed, CSR is regarded a voluntary and beyond compliance undertaking that integrates several health, safety, social and environmental concerns into company's strategy and decision making process [29]. With regards to quality, Frolova and Lapina (2014) supports that CSR correlates to quality management approach. In that sense, a quality management system forms the basis to create and diffuse CSR and sustainability at all levels of the organization [14]. Indeed, bearing in mind the issue of quality within an organization, which in broad terms extends beyond compliance with minimum statutory requirements, we could assume that the concepts of CSR and quality have plenty crossings [6]. In such perspective, implementing a CSR strategy is expected to improve the service quality to customers and well-being of employees within the organization and society, through the reduction of workplace risk and negative impacts (economic, social and environmental), fulfilling, thus, indirectly, sustainability objectives [29].

In an attempt to frame CSR within the maritime context, it could be alleged that, traditionally, CSR notion has been treated synonymously to: *'quality shipping'*. In that sense, the *quality* notion reflected the attempt of ship owners to manage their ships in compliance with applicable, national, regional and international health, safety and environmental protection rules, maintaining, thus, profitability of their business [23]. As per Donaldson (1994) the issue of quality in shipping encompassed ship owners' effort to eliminate substandard vessels. However, globalization trends, stricter regulation, increasing efforts for more transparency and control on labour rights, easier flow of information, growing stakeholders' pressure on sustainability, maintenance of good customer relations and the vulnerable to accidents image of shipping have made maritime companies to transform their perceptions towards *'quality'* [23]. It is therefore expected that, although the management of ships has been, habitually, referred to an activity mostly governed by typical maritime statutory legislation, though, worldwide regulatory and business developments have affected the structure of traditional safety management systems that govern shipping operations. Further to that, it is believed that engagement with CSR and sustainability developments has influenced the traditional approach to SMSs and has urged shipping companies to increase incorporation of relevant CSR and sustainability principles/standards into their

SMS requirements and structure [20]. In the outcome of such argumentation, the following hypotheses are formulated:

H_2 (a): Incorporation into company's SMS of the provisions of a CSR Standard is significantly influenced by engagement of CSR principles into company's policy.

H_2 (b): Incorporation into company's SMS of the provisions of a Sustainability Standard is significantly influenced by engagement of CSR principles into company's policy.

4. Research Methodology: Sampling, data collection and analysis methods

In line with our research aim, this study has adopted a deductive method of reasoning and has been conducted by employing a quantitative research approach. Consistent with adopted methodology, our research commences by reviewing the literature and analysing theories related to our topic. Next, specific hypotheses are developed and variables identified [21]. Quantitative data has been collected using a self-administered questionnaire survey. As such, an electronic questionnaire was sent via email to 50 shipping companies, based in 14 different countries. Survey participants work in various departments such as, operations, QHSE, technical, HR, management and accounting and, in that sense, they are considered to be adequately aware and experienced to express their organization's perceptions and attitude toward CSR and sustainability. Participating companies were identified as those having assumed the technical management of dry bulk carriers and/or tanker vessels. The management of other ship types (i.e. containerships) was also permissible, however, it was obligatory that, along with other ship types, they should manage dry bulk carriers and/or tanker vessels. All variables (independent and dependent) were presented as statements and respondents were asked to indicate their level of agreement on a five point Likert (Strongly Agree to Strongly Disagree) and Yes/I am not sure/No, scale of choices. Moreover, descriptive statistics are employed to discuss demographics and provide some general inferences of our collected data [27].

The nature of selected variables and collected data has determined the test selection to verify our hypotheses. In particular, *hypothesis 1* (H_1) is tested using *Spearman's correlation* measure. Such selection is done on the basis that both dependent and independent variables are categorical, measured on an ordinal scale. The *p-value* obtained by the observed correlation R_s value and the sample size, determine whether a statistically significant relationship between variables exists. A *p-value* which is less than *a=0.05* (level of significance) suggests a statistically significant relationship between variables and implies rejection of null hypothesis. Moreover, *Spearman's correlation coefficient* (R_s) is used to

determine the strength of such association. Coefficient R_s ranges between -1 (perfect negative correlation) to 1 (perfect positive correlation). A value close to 0 implies no relationship between variables [33]. With regards to *hypotheses* $2_{(a)}$ and $2_{(b)}$, c*hi-square test of independence* is employed to examine whether a statistically significant relationship between variables exists. Selection of this test was based on the assumption that variables are categorical, measured on a nominal and ordinal scale. On a conceptual basis, the null hypothesis is rejected, when the *p-value* is less than *a=0.05* (significance level). Suitably to the data type, *contingency coefficient* (C) measure is further used to determine the strength of such association. *Contingency coefficient* (C) value ranges between -1 to 1. Values close to -1 indicate a strong negative association, while values close to 1 show a perfect positive association. 0 values imply that there is no association between variables [24]. The Statistical Package for Social Sciences (SPSS) version 25 for windows was used for conducting our statistical analysis.

Table 4.1 below summarizes our research hypotheses and corresponding variables incorporated in our survey and data analysis.

Table 4.1 Independent and Dependent Variables and Corresponding Hypotheses

Alternative Hypothesis	Independent Variable	Dependent Variable	Test
H_1: CSR understanding as an integrated and beyond regulatory compliance notion is significantly influenced by sustainability perception under its three dimensions.	Sustainability understanding under its three dimensions. **(Ordinal)**	CSR understanding as an integrated and beyond regulatory compliance notion. **(Ordinal)**	Spearman's correlation coefficient
$H_{2\ (a)}$: Incorporation into company's SMS of the provisions of a CSR Standard is significantly influenced by engagement of CSR principles into company's policy.	Engagement of CSR principles. **(Nominal)**	Incorporation into company's SMS of the provisions of a CSR Standard. **(Ordinal)**	Chi-square test of independence
$H_{2\ (b)}$: Incorporation into company's SMS of the provisions of a Sustainability Standard is significantly influenced by engagement of CSR principles into company's policy.	Engagement of CSR principles. **(Nominal)**	Incorporation into company's SMS of the provisions of a Sustainability Standard. **(Ordinal)**	Chi-square test of independence

5. Results

5.1 Descriptive Statistics

A descriptive statistics analysis has been done with the objective to present an overview of demographics, and companies' perceptions and practices from CSR and sustainability engagement. The nature of collected data, which are categorical, measured on a nominal and ordinal scale implies that our selected variables will be described by their frequency distribution.

Demographics

Participating companies, having assumed the technical management of ships, are based in 14 different countries around the globe. The majority of them are based in Norway (22%) and Greece (20%), while 10% are based in Italy, Turkey, Monaco, Sweden and Belgium. Such a variety diversifies study results and, thus, does not limit our survey scope and findings to the context of a single country. Out of the total 50 respondents, 76% are males with the remaining 24% being females. The biggest participants group (34%) belonged to the 41 to 50 years old age group. The majority of the respondents (64%) are employed in the QHSE department, while 4% are employed in the technical and accounting/management departments. With regards to company's size, 52% manage a fleet that ranges between 1 to 40 ships, while 48% manage more than 41 ships. The majority of companies (58%) employed (both at the office and ashore personnel) more than 251 persons, while 8% answered that their employees' number ranges between 1 to 50 persons. The highest companies' rate (48%) represents ship owning companies performing exclusive technical management services to a sole ship owner. Moreover, 74% answered that they manage tankers and/or gas carrier vessels and dry bulk vessels, while 4% manage passenger/cruise ships, additionally to their dry and tanker managed fleet. Reviewing demographical data, it can be assumed that there is a diversification of our sample population, in terms of companies' size, management 'style' and types of managed ships. Furthermore, the fact that participants are mostly occupied in the QHSE department, demonstrates a good awareness level and participants' involvement related to CSR matters within their organization.

Awareness and attitude

Most of the participants (94%) answered that they were personally aware of CSR theme, while 6% of the participants replied that they were not aware. Moreover, 82% of the companies have adopted CSR policy/principles into their ship management policy. Such a fact seems to be consistent with our literature

review conclusions, which implies that CSR refers to an expanding concept that has been, steadily, reflected into shipping companies' policy and operating practices [30]. Interestingly, 70% consider the establishment of a sustainability policy/programme to be part of company's CSR policy/program. Such evidence is aligned with IMO's standpoint, namely, that sustainability initiatives should form part and embraced into a wider CSR philosophy [18]. However, it is worth commenting at this point that CSR awareness and adoption of its principles is a questionable issue. CSR awareness is an element that bears a lot of subjectivity, since it does not offer us any qualitative information about how practically (i.e. through which procedures, policies, operating practices) CSR is captured and implemented throughout shipping operations (as this is out of the scope of this study).

Literature review deductions are also consistent empirical findings, which show that 96% of companies understand CSR as the conduct of business operations in a manner that goes beyond mere compliance with statutory health, safety and environmental regulations (i.e. ISM, ISPS, SOLAS, MARPOL, MLC etc.) and integrates social, economic, environmental, ethical, human rights and consumer concerns into business operations and management strategy [4]. Such result is consistent with perceptions that treat CSR as a voluntary approach that goes beyond what minimum law requires [31]. Another important feature derives from the fact that although the majority of the companies have incorporated CSR principles (82%), however, only 2% found to have been officially certified against a CSR Standard (i.e. ISO2600, SA8000 etc.). Such companies' stance is, potentially, attributed to the plethora of maritime regulations that, traditionally, have been governing several social, health, safety and environmental aspects of shipping operations [3]. In line with this attitude, is also Yuen and Lim (2016) study, which identifies existing maritime regulatory regime as adequate to address industry's social and environmental issues. Such considerations have, potentially, deterred certification against an official CSR Standard (i.e. ISO26000), which could be viewed as pleonasm by shipping companies [3]. Consistent with our literature review conclusions is the fact that 82% perceives sustainable development as the conduct of business in a way that company's economic, social and environmental impacts are considered and eliminated. This result is highly representative and in line with the current regulatory regime, which considers sustainability in an integrated manner (triple bottom line approach to sustainability) [2].

Practices, Measurement and Disclosure

98% of the responding companies considered the provisions of maritime statutory legislation to be very important to the formulation of their safety management system. Such a finding was expected since the

shipping industry has, traditionally, been more familiar with statutory maritime regulations, than with CSR and sustainability requirements of non-maritime related conventions. However, interestingly, 74% consider CSR and sustainability principles to be also very important to the formulation of their company's SMS. Considering such attitude, and contrasting it with our literature review assumptions, it is further assumed that CSR and sustainability concepts have been drastically expanding to the shipping industry and have urged shipping companies to incorporate relevant principles/standards into their SMSs formulation [20].

The preferred type of performance reporting was found to be an integrated health, safety and environmental report (72%). It is worth mentioning that only 16% use a standalone CSR/sustainability performance reporting type, which is considered to be a low rate of preference, comparing to the fact that 82% have adopted CSR policy/principles. In conjunction with this, only 18% communicates their performance measurement report externally (i.e. industry / press). Such findings confirm that the use of dedicated CSR/sustainability reporting still remains at an early stage. Additionally, the conventional approach to performance measurement and reporting (namely the integrated health, safety & environmental report) is, mainly, destined for internal communication (i.e. top management, company's employees etc.). Such findings come to affirm Lund-Thomsen, Poulsen and Ackrill (2016) standpoint, namely, that devoted CSR measurement and reporting tools in shipping, although growing, however, are not yet at an advanced stage as it has been the case in other industries (i.e. aviation, auto sectors etc.).

5.2 Hypotheses Testing Results

5.2.1 Hypothesis 1 Testing results

According to the *Spearman's correlation measure*, the *p-value* is *0.000*, which shows a statistically significant relationship between variables. As such, at the level of significance *a=0.05*, companies' understanding of sustainable development under its three dimensions, is significantly related with their perception of CSR as the conduct of operations in a manner that goes beyond mere regulatory compliance and integrates social, economic and environmental concerns into business operations. Therefore, the null hypothesis is rejected.

Moreover, from the application of *correlation coefficient (Rs)* measure, estimated R_s value is *0,526*. Such result implies that there is a positive association between variables. Therefore, further increasing companies' understanding on sustainable development in its three dimensions (independent variable) is expected to raise CSR comprehension as the conduct of operations in a manner that goes beyond mere regulatory compliance and integrates social, economic and environmental concerns into

business operations (dependent variable). Furthermore, as implied by applied correlation, obtained results are valid for more than 99% of companies. **Table 5.1** below summarizes the results from the application of Spearman's correlation measure.

Table 5.1 Hypothesis 1 Testing results: Application of Spearman's correlation measure

Null Hypothesis	p-value	Spearman's correlation coefficient (R_s)	H_0 Rejected (a<0.05)
H_0: CSR understanding as an integrated and beyond regulatory compliance notion is not significantly influenced by sustainability perception under its three dimensions.	*0,000**	*0.526***	*Yes*

Notes: * H_0 rejected at significance level p<0.05

** -1≤ (Rs) ≤1, -1= perfect negative relationship, 0= No relationship, 1 = perfect positive relationship

5.2.2 Hypothesis $2_{(a)}$ Testing results

Applying c*hi-square test of independence*, the *p-value* is *0.000*. As such, at the level of significance *a= 0.05*, companies that engage CSR principles are more likely to have mainly incorporated in their SMS the provisions of a CSR Standard (***X^2 (8) = 36,832, p-value = 0.000***). As a result, a statistically significant relationship between variables is identified and the null hypothesis is rejected.

From the application of c*ontingency coefficient* measure, obtained value is *0.651*. This result indicates a positive correlation between variables. Therefore, it is assumed that further increasing CSR engagement into company's policy (independent variable) is expected to reasonably accelerate the incorporation into company's SMS of the provisions of a CSR Standard (dependent variable).

5.2.3 Hypothesis $2_{(b)}$ Testing results

According to c*hi-square test of independence*, the *p-value* is *0.000*. Therefore, at the level of significance *a= 0.05*, companies that engage CSR principles are more likely to have widely incorporated into their SMS the provisions of a sustainability Standard (***X^2 (8) = 30,402, p-value = 0.000***). As such, a statistically significant relationship between variables is acknowledged and the null hypothesis is rejected.

Estimated c*ontingency coefficient* value is *0,615*. Such result implies a positive association between dependent and independent variables. Thus, it is expected that further engaging CSR into company's policy (independent variable) is estimated to raise to some extent the incorporation into SMS of the provisions of sustainability Standard (dependent variable). **Table 5.2** below summarizes the results from the application of *chi-square test of independence and Contingency Coefficient* measure.

Table 5.2 Hypotheses 2 Testing results: Application of chi-square test of independence and Contingency Coefficient

Null Hypothesis	p-value	X^2	Contingency Coefficient (C)	H_0 Rejected (a<0.05)
$H_{0\,(a)}$: Incorporation into company's SMS of the provisions of a CSR Standard is not significantly influenced by engagement of CSR principles into company's policy.	*0,000**	*36,832*	*0.651***	*Yes*
$H_{0\,(b)}$: Incorporation into company's SMS of the provisions of a Sustainability Standard is not significantly influenced by engagement of CSR principles into company's policy.	*0,000**	*30,402*	*0.615***	*Yes*

Notes: * H_0 rejected at significance level $p<0.05$
** $-1 \leq C \leq 1$, -1=perfect negative relationship, 0= No relationship, 1 = perfect positive relationship

6. Discussion

As indicated by the study results, the perception of CSR as the conduct of business operations in a manner that goes beyond mere regulatory compliance and integrates social, economic, environmental, ethical, human rights and consumer concerns into business operations, is highly diffused in the shipping industry. The various viewpoints that consider CSR either as synonymous to sustainability or as the social division of sustainable development have not been, widely, adopted by shipping companies [26]. According to this study, companies' understanding suggests that CSR is considered to be a multidimensional subject (health, safety, environmental, labour etc.), which embraces various topics and aspects that extend beyond mere compliance with statutory requirements [10]. Additionally, CSR refers to a concept and decision taken at strategic level. Such study results provide important deductions when reviewed in conjunction with companies' understanding on sustainability. As per research results, sustainable development has been understood as the conduct of business in a way that company's economic, social and environmental impacts are considered and, as such, business activities are performed transparently and with the aim to eliminate social and environmental impacts. Such finding leads to the deduction that shipping companies have restructured their knowledge and, thus, recognized sustainability as an integrated challenge [37]. Similarly, evidence from testing *hypothesis H_1* indicates that shipping companies' current standpoint on CSR is fully aligned with contemporary understanding on sustainable development (as defined under its triple bottom line approach) [18]. Additionally, the positive relationship between our dependent and independent variables (as indicated by *correlation coefficient (Rs)* measure*, 0.526*) denotes that the more companies appreciate sustainability under its three dimensions, the more they comprehend CSR as a voluntary and beyond compliance business model that integrates sustainability challenges.

Shipping operations have been mostly governed and ruled by typical maritime statutory standards and Conventions [20]. According to Yuen and Lim (2016), the non-adoption of CSR by shipping companies is, primarily, attributed to the ample existing regulatory standards, which are considered sufficient to address social, health, safety and environmental matters in the maritime industry. As a matter of fact, the burden of regulations forces maritime companies to devote most their time complying with existing statutory maritime regulations, rather than exceeding them, though, i.e. the adoption of voluntary CSR/sustainability Standards [42]. However, as this study has revealed, CSR and sustainability principles have been raising their ground into operating practices and procedures of shipping companies, through their incorporation into safety management systems. In other words, shipping companies have, progressively, commenced formulating their SMS, based on the provisions of CSR and sustainability Standards. Similarly, results from testing *hypothesis* $H_{2\,(a)}$ *and* $H2_{\,(b),}$ allow us to confirm that engaging CSR and sustainability principles into an organization's policy, urges companies to transform their traditional approach to SMS and incorporate into it relevant CSR/sustainability provisions. Furthermore, the positive relationship identified between our dependent and independent variables (as indicated by c*ontingency coefficient (C)* values *0.651* and *0.615*) signifies that the more we increase CSR principles engagement within an organization, the more we raise the integration into company's SMS the provisions of a CSR/sustainability Standard. It is worth commenting at this point that, according to our study, such growing integration into SMS of the provisions of CSR and sustainability Standards has not been, essentially, accompanied by companies' desire to achieve official certification against an approved industry Standard [3]. Such a stance is, potentially, attributed to the voluntary and beyond compliance perceived character of CSR notion which, along with the adequacy of existing maritime legislation to deal with CSR and sustainability challenges, deters shipping companies to seek certification against an official CSR/Sustainability Standard [42].

7. Implications and Limitations

7.1 Implications

The main aim of this study was to investigate perceptions and practices associated with the application of CSR and sustainability developments in the shipping industry, and, specifically, in the tanker and dry bulk shipping sector. Further to our research findings, this study advances our insight and enhances our understanding on CSR and sustainability notions in shipping. Accordingly, the first implication relates to the identification of CSR as a beyond regulatory compliance and voluntary initiative that shares several

aspects of business operations (i.e. social, environment, health, labor etc.). In terms of sustainability, it has been, without doubt, recognized by shipping companies as an integrated economic, social and environmental approach to ensure business viability. Being aware of such reasoning, practitioners can use this knowledge and consider CSR as a facilitator and vehicle in their attempt to integrate sustainability in their operations. Thus, bearing in mind such interpretations can assist to overcome barriers and practical issues generated by their implementation. Moreover, study findings could constitute a good starting point for researchers and academics to build on such conclusions and investigate further various generated interactions, practical implications and implementation issues.

Policy makers and regulators can employ study findings and formulate effective and practical CSR and sustainability regimes that would assist shipping companies to achieve their objectives. A fundamental idea stems from the recognition of CSR as a strategic, voluntary and beyond compliance approach that integrates sustainability elements. Such a finding, viewed in combination with the fact that shipping companies have not sought official certification against an approved CSR standard, although the vast majority of them have adopted CSR principles into their policy, demonstrates shipping industry's unfavourable stance towards the formulation of a new mandatory CSR regulatory regime. In support to this view has been also the fact that the vast majority of shipping companies has already incorporated into their SMS the provisions of CSR and sustainability Standards, without having, primarily, been officially certified. Therefore, policy makers and regulators should direct their efforts in advancing companies' theoretical and practical awareness on sustainable development requirements and CSR implementation and reporting techniques, rather than establishing a new statutory CSR regulatory regime.

Clarifying theoretical and practical dimensions of CSR and sustainability can, positively, facilitate ship managers into their day to day operations and provide them with practical solutions. Bearing in mind research findings, ship managers should, primarily, adopt CSR at strategic level. Sustainability objectives need to be reflected into company's safety management system and, therefore, a business operating model, founded on CSR principles, has to be, subsequently, developed. Secondly, the non-official certification against a CSR standard should not be seen as a factor that decreases company's ability to, effectively, deal with sustainability challenges. However, modernization and adoption of alternative integrated CSR measurement and reporting methods refers to an area that shipping companies need to consider and improve, in order to meet latest CSR and sustainability measurement and reporting standards requirements.

7.2 Limitations and Future Opportunities

There are some limitations associated with this study. Firstly, our research does not take into account opinions of other shipping stakeholders, such as charterers, Flag Administrations, Port States etc. As such, results cannot be generalized and compared with the views of such important industry stakeholders. Therefore, additional research is recommended in order to take into account further entities, with the aim to enrich even further study findings. Secondly, the element of subjectivity that characterizes perceptions, awareness and practices of CSR and sustainability calls for further research and engagement of qualitative information. In that sense, it is encouraged the further investigation of actual companies' procedures, policies, operating practices, management systems structure etc. so as to ascertain '*how*', practically, CSR and sustainability is captured and implemented throughout shipping operations. Thirdly, conclusions drawn by this study should be also considered in conjunction with CSR and sustainability standards and practices employed by other industries (i.e. aviation, chemical industry, oil & gas etc.). The objective would be to provide further insights, compare CSR in shipping with other industries, discover gaps and provide solutions that will overcome barriers and facilitate CSR and sustainability implementation in shipping.

To sum up, it can be concluded that our research findings are valid for the sample of companies investigated and reflective of their personnel responses against statements in the questionnaire. The fact that shipping companies are globally based gives us the flexibility not to restrict study results to the context of a single country or market area. However, although findings suggest that shipping companies have, gradually, increased their awareness and implementation of CSR and sustainability into their operations, though, further research is recommended to address identified limitations.

8. Conclusions

Our study intended to illuminate shipping companies' perceptions and practices related to CSR and sustainability implementation. The relatively recent engagement of the shipping industry with such notions, latest growing trends and regulatory developments in that field, and the limited related empirical studies in the dry and tanker sector, justifies our motivation to research this area. Literature review and empirical research showed that CSR and sustainability are, nowadays, highly diffused and reflected into shipping companies' policies and operating practices. Maritime professionals appear to be well-conversed with CSR concept, which is mainly perceived as a voluntary and beyond compliance approach that,

furthermore, integrates sustainability elements. On the other hand, sustainable development is also understood as an integrated notion (economic, social and environmental), which intersects and forms part of CSR concept and can be, furthermore, effectively achieved when it is grounded on CSR principles. In terms of CSR and sustainability implementation, shipping companies, although they have progressively integrated such notions into their policy, however, they are not keen of obtaining official certification against an approved CSR/sustainability standard. Such an attitude could be justified by the plethora and adequacy of existing maritime legislation [42]. Nevertheless, as study findings revealed, shipping companies have moved a step forward and incorporated into their safety management systems the provisions of CSR and sustainability standards and guidelines, in their attempt to achieve sustainability. Though, it should not be overlooked companies' overall approach to the whole issue, which calls for enhanced information, training, education on sustainability and CSR implementation, rather than development and enforcement of a statutory CSR regime. Besides, the employment of dedicated CSR/sustainability measurement and reporting methods is an area that needs to be further developed, as shipping companies prefer to measure and report their overall performance by using and integrated health, safety and environmental report. Further research on this topic is recommended, focusing on best management practices and effective implementation aspects to be promoted, so as to assist the shipping industry achieving its sustainability goals.

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References

1. Asif, M., Searcy, C., Zutshi, A., & Fisscher, O. A. (2013). An integrated management systems approach to corporate social responsibility. Journal of cleaner production, 56, 7-17.

2. Alhaddi, H. (2015). Triple bottom line and sustainability: A literature review. Business and Management Studies, 1(2), 6-10.

3. Abrahamsson, S., Isaksson, R., & Hansson, J. (2010). Integrated management systems: advantages, problems and possibilities. In 13th Toulon-Verona Conference (pp. 1-12).

4. Aras, G., & Crowther, D. (2008). Corporate social responsibility. David Crowther, Guler Aras & Ventus Publishing Aps.

5. Bhagwat, P. (2011, March). Corporate social responsibility and sustainable development. In Proceedings of the Articles and Case Studies: Inclusive & Sustainable Growth Conference (Vol. 1, No. 1).

6. Bernal-Conesa, J. A., Briones-Peñalver, A. J., & De Nieves-Nieto, C. (2016). The integration of CSR management systems and their influence on the performance of technology companies. European journal of management and business economics, 25(3), 121-132.

7. Castka, P., Bamber, C. J., Bamber, D. J., & Sharp, J. M. (2004). Integrating corporate social responsibility (CSR) into ISO management systems–in search of a feasible CSR management system framework. The TQM Magazine, 16(3), 216-224.

8. Coady, L., Lister, J., Strandberg, C., & Ota, Y. (2013). The role of corporate social responsibility (CSR) in the international shipping sector. A phase, 2.

9. Cutler J Cleveland, Natural resource scarcity and economic growth revisited: Economic and biophysical perspectives, Boston University | BU · Department of Earth & Environment, Nov 30, 2014

10. Davis, K. (1973). The case for and against business assumption of social responsibilities. Academy of Management journal, 16(2), 312-322.

11. European Commission. (2011). Corporate social responsibility: A new definition, a new agenda for action. MEMO/11/730. Brussels, 25 October 2011

12. Elkington, J. (2013). Enter the triple bottom line. In The triple bottom line (pp. 23-38). Routledge.

13. EU-UN Partnership Toolkit and Guidance for Preventing and Managing Land and Natural Resources Conflicts, Renewable Resources and Conflict, UN Interagency Framework Team for Preventive Action Hosted by: UNDP, Bureau for Crisis Prevention and Recovery, 2012, Available from: http://www.un.org/en/land-natural-resources-conflict/pdfs/GN_Renew.pdf, Accessed: 05/06/2018

14. Frolova, I., & Lapina, I. (2014). Corporate social responsibility in the framework of quality management. Procedia-Social and Behavioral Sciences, 156, 178-182.

15. Gallagher, C., Underhill, E., & Rimmer, M. (2003). Occupational safety and health management systems in Australia: Barriers to success. Policy and Practice in Health and Safety, 1(2), 67-81.

16. Haralambides, H. E. (1996). The economic impact of shipping on the national economy. Review of Economics and Statistics, 18(3), 105-125.

17. Hughes, P., & Ferrett, E. (2011). Introduction to health and safety at work: The handbook for the NEBOSH national general certificate. Routledge.

18. International Maritime Organization, A Concept of a Sustainable Maritime Transportation System, Sustainable Development: IMO's Contribution beyond RIO+20, Published on World maritime Day 2013

19. International Maritime Organization (IMO), Introduction to the Application of the Strategic Plan and the High-Level Action Plan (Resolution A.1099 (29)), IMO, Executive Office of the Secretary-General, January2016

20. Kunnaala, V., & Viertola, J. (2014). IMISS 2013-Proceedings of the International Scientific Meeting for Corporate Social Responsibility (CSR) in Shipping 2nd International Maritime Incident and Near Miss Reporting Conference 11-12 June 2013, Kotka, Finland.

21. Kothari, C. R. (2004). Research methodology: Methods and techniques. New Age International.

22. Lombardo, R. (2009). BEYOND COMPLIANCE: FIRMS'ENVIRONMENTAL BEHAVIOUR. A SURVEY (No. 200918).

23. Lund-Thomsen, P., Poulsen, R. T., & Ackrill, R. (2016). Corporate social responsibility in the international shipping industry: state-of-the-art, current challenges and future directions. The Journal of Sustainable Mobility, 3(2), 3-13.

24. Lucerne University of Applied Sciences and Arts, Chi-square contingency, Available from: https://www.empirical-methods.hslu.ch/decisiontree/relationship/chi-square-contingency/, Accessed: 10/09/2018

25. McNamara, N. (2013). Corporate social responsibility and compliance: Transnational mining corporations in Tanzania. Macquarie J. Int'l & Comp. Envtl. L., 9, 1.

26. Monachino, M. S. (2016). The Corporate Social Responsibility (CSR) approach as a framework for business involvement in health promotion in the welfare state (Doctoral dissertation, Linköping University Electronic Press).

27. Neuman, W. L. (2013). Social research methods: Qualitative and quantitative approaches. Pearson education.

28. O'Neil, W. A. (2003). The human element in shipping. WMU Journal of Maritime Affairs (JoMA)

29. Pawlowska, Z. From OSHwiki, 24 April 2013, Occupational safety and health management and corporate social responsibility (CSR), Central Institute for Labour Protection - National Research Institute, Poland

30. Prizing-Jorgensen, P. M., & Farrag, A. (2010). Sustainability trends in the container shipping industry: A future trends research summary. Business for Social Responsibility.

31. Reinhardt, F. L., & Stavins, R. N. (2010). Corporate social responsibility, business strategy, and the environment. Oxford Review of Economic Policy, 26(2), 164-181

32. Repetto, M. S. (2005). Towards an Ocean Governance Framework and National Ocean Policy for Peru. The United Nations-The Nippon Foundation of Japan Fellow (mimeo).

33. Spearman's Rank Correlation Coefficient Rs and Probability (p) Value Calculator, Available from: https://geographyfieldwork.com/SpearmansRankCalculator.html, Accessed: 20/07/2018

34. Ships, S. (1994). Cleaner Seas (Report of Lord Donaldson's Inquiry into the Prevention of Pollution from Merchant Shipping).

35. Scott, A., Worrall, L., & Pickard, S. (2018). Energy, migration and the 2030 Agenda for Sustainable Development. ODI Briefing Note. London: ODI.

36. Sheehy, B. (2015). Defining CSR: Problems and solutions. Journal of Business Ethics, 131(3), 625-648.

37. Slaper, T. F., & Hall, T. J. (2011). The triple bottom line: What is it and how does it work. Indiana business review, 86(1), 4-8.

38. The Three Pillars of Sustainability, Available from: http://www.thwink.org/sustain/glossary/ThreePillarsOfSustainability.htm, Accessed: 22/11/2016

39. UNIDO Brussels - United Nations Industrial Development Organization, CSR will help enterprises achieve Sustainable Development Goals (SDGs), Posted by UNIDO 9 February 2015, Available from: https://europa.eu/capacity4dev/unido/blog/csr-will-help-enterprises-achieve-sustainable-development-goals-sdgs, Accessed: 16/06/2018

40. United Nations. (1987). Report of the world commission on environment and development: our common future. UN Documents.

41. United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. Resolution adopted by the General Assembly.

42. Yuen, K. F., & Lim, J. M. (2016). Barriers to the implementation of strategic corporate social responsibility in shipping. The Asian Journal of Shipping and Logistics, 32(1), 49-57.